

What is claimed is:

1. A mutant trichosanthin (MTCS) protein of low antigenicity, comprising the amino acid sequence of native
5 trichosanthin (TCS), with the modification of at least one amino acid residue in the following three regions: amino acid residues 174 to 180, 203 to 226, and 230 to 244; or a fragment or derivative of said MTCS protein containing said modification and substantially retaining the biological
10 activities of the native TCS.
2. A mutant protein or a fragment or derivative thereof according to claim 1, wherein said modification is selected from the group consisting of deletion, insertion, addition,
15 replacement, and chemical modification.
3. A mutant protein or a fragment or derivative thereof according to claim 2, wherein said replacement is selected from the group consisting of replacing a hydrophilic amino
20 acid residue with a hydrophobic amino acid residue, replacing a hydrophobic amino acid residue with a hydrophilic amino acid residue, replacing an acidic amino acid residue with a basic amino acid residue, and replacing a basic amino acid residue with an acidic amino acid
25 residue.
4. A mutant protein or a fragment or derivative thereof according to claim 1, wherein said modification can cause a change in the electric charge of the amino acid site where
30 said modification is being made.
5. A mutant protein or a fragment or derivative thereof

according to claim 1, wherein at least one amino acid residue selected from the group consisting of arginine at position 174, lysine at position 177, arginine at position 222 and arginine at position 243 is independently replaced
5 with glutamic acid, aspartic acid, or glycine.

6. A mutant protein or a fragment or derivative thereof according to claim 1, wherein at least one amino acid residue selected from the group consisting of aspartic acid
10 at position 176, asparagine at position 205, asparagine at position 206, glutamine at position 208, glutamic acid at position 210, asparagine at position 217, glutamine at position 219, asparagine at position 220, glutamine at position 221, asparagine at position 236, asparagine at
15 position 242, and asparagine at position 244 is independently replaced with lysine or glycine.

7. A mutant protein or a fragment or derivative thereof according to claim 1, wherein at least one amino acid residue selected from the group consisting of threonine at
20 position 178, serine at position 203, threonine at position 204, serine at position 211, threonine at position 224, threonine at position 226, threonine at position 234, and serine at position 235 is independently replaced with
25 glycine or alanine.

8. A mutant protein or a fragment or derivative thereof according to claim 1, wherein at least one amino acid residue selected from the group consisting of valine at
30 position 175, phenylalanine at position 179, leucine at position 180, glycine at position 207, phenylalanine at position 209, proline at position 212, valine at position

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213, valine at position 214, valine at position 215, valine at position 223, isoleucine at position 216, isoleucine at position 225, alanine at position 218, alanine at position 230, alanine at position 238, glycine at position 231, 5 valine at position 232, valine at position 233, isoleucine at position 237, leucine at position 239, leucine at position 240, and leucine at position 241 is independently deleted.

10 9. A mutant protein or a fragment or derivative thereof according to claim 1, wherein at least one amino acid residue is modified in each one of any two or three of said three regions.

15 10. A mutant protein or a fragment or derivative thereof according to claim 9, wherein lysine at position 177 is replaced with glutamic acid, and serine at position 203 is replaced with glycine.

20 11. A mutant protein or a fragment or derivative thereof according to claim 9, wherein lysine at position 177 is replaced with glutamic acid, serine at position 203 is replaced with glycine, and asparagine at position 236 is replaced with glycine.

25 12. A nucleic acid encoding a mutant protein or a fragment or derivative thereof according to claim 1.

13. A vector comprising a nucleic acid according to claim 30 12.

14. A host cell transformed with a nucleic acid according

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15. A process for preparing a mutant protein or a fragment or derivative thereof as defined in claim 1, comprising culturing a host cell according to claim 14 under a favorable condition for the expression of said mutant, and recovering said mutant from the culture.

17. A method for inducing abortion and/or treating ectopic
15 pregnancy in a mammal, comprising administering to said
mammal an effective amount of a mutant protein or a
fragment or derivative thereof according to claim 1.

19. A method for treating tumors in a mammal, comprising administering to said mammal a therapeutically effective amount of a mutant protein or a fragment or derivative thereof according to claim 1.

30 20. A method for treating leukemia in a mammal, comprising administering to said mammal a therapeutically effective amount of a mutant protein or a fragment or derivative

thereof according to claim 1.

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